Formation of College Plans:
Expected Returns, Preferences and Adjustment Process

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Motivation

- Whether to **attend college** is an important decision with long-run implications

- Youths make college **plans** and shape human capital **investments** accordingly

- Plans capture students' expectations and preferences that are (partially) malleable

- Little is known about **what influences** educational plans and **whether** (and **how fast**) they adapt to a changing environment.

Challenges:
1) Requires detailed time series **data on plans and determinants.**
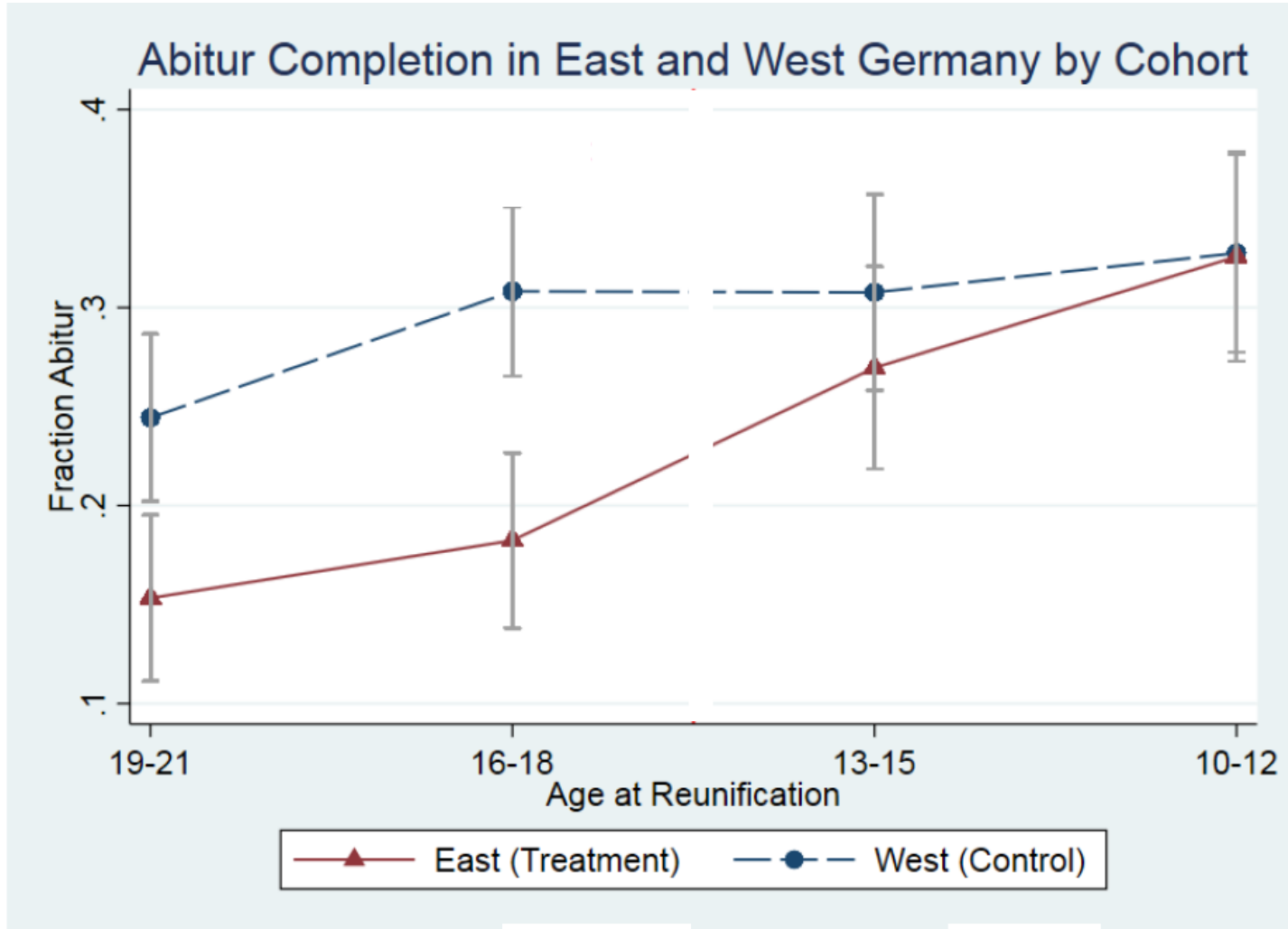2) Environment in which plans are formed/adjust to is **endogenous**.

This Paper

Main research questions:

- How are educational plans formed? How do they adjust to changes in the environment? Are they linked to long-run outcomes?

How we do this:

- **Quasi-experiment:** German Reunification in October 1990
  - Focus on the college plans of East German adolescents

College Entrance Certificate ("Abitur")

Abitur Completion in East and West Germany by Cohort

This Paper

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Specific questions:

1) What is the effect of a large shock on Abitur plans and later outcomes?
2) What are the **mechanisms** behind the change in educational plans?
   - Perceived returns to education and risk
   - Economic and social preferences
   - Constraints (supply-side)
3) What is the **process** of adjustment: How do different cohorts respond and which determinants adjust at what speed?

Preview of Results

Main Results:

- Early educational plans are a good predictor for Abitur attainment.

- Shock led to a **rapid** increase in youths' **Abitur plans** (by 22 p.p.).
  - Translates into important increase in later **Abitur completion**.

- **Timing is key:** closeness to completion of degree important for adaptation

Mechanisms:

- Rapid increase in expected returns to education.

- Important changes in economics and social preferences.

- Change in Abitur plans linked to changes in beliefs and preferences

- Not explained by changes in constraints or education quality/content

Adjustment Process:

- Similar change in expected returns of older and younger cohort.

- *Smaller* adjustment in preferences for older cohort.

Events and Education

- Germany split amongst the winning Allies after WW2:
    - East Germany occupied by Soviets and West by US, France, and UK
- In 1949, a **border** formed between East and West and then the Berlin Wall
- Fall of Berlin Wall in November 1989 and Reunification in October 1990
- East Germany converges to regime of West

Education

- Education system of East and West stem from same educational roots
- Divergences during separation but similar elements, like entry to college
    - Completion of **"Abitur":** entrance ticket to college
- College Participation: **30%** in West v **20%** in East (Below et al., 2013)
- Returns to college: Average net income with degree **15%** higher than blue-collar workers in East v **70%** in West (Alesina and Fuchs-Schuendeln, 2007)

Data from "Longitudinal Study of Students"

- Follows two cohorts of adolescents in East Germany, 3 yrs apart in age
    - Students, parents, teachers interviewed between 1986 and 1995 including **shortly before and shortly after Reunification.**

- **Main variable of interest:** if youths plan to obtain the Abitur (entrance certificate for university access)

- **Other variables:**
    - Long-run: Abitur completion
    - Mechanisms:
        - Perceived returns to education
        - Economic, social and political preferences
        - Constraints

Identification Strategy

- **Difference-in-Differences (DID) Approach:**
  - **Treatment:** change in educational plans for the **younger cohort** (**before and after Reunification**)
  - **Control:** as counterfactual trend use evolution of **older cohort's** plans between the same grades (**before Reunification**).

Older Cohort: grade 8 (1988, aged 14) is in *pre-Reunification* period

Younger Cohort: grade 8 (1991, aged 14) is in *post-Reunification* period

- Focus on the grades directly **pre- and post-**Reunification for the **younger cohort** (i.e., in grades 7 & 8), while the **older cohort** is **pre-**Reunification in both grades.

- We estimate:

$$EP_{icg} = \beta_0 + \beta_1 Treat_{ic} + \beta_2 Post_{ig} + \beta_3 \left(Treat_{ic} Post_{ig} \right) + D_i + \varepsilon_{icg}$$

Short-Run Impact: Graphical Description

Educational Plans: Older Cohort

Qu: Do you plan to obtain the Abitur?
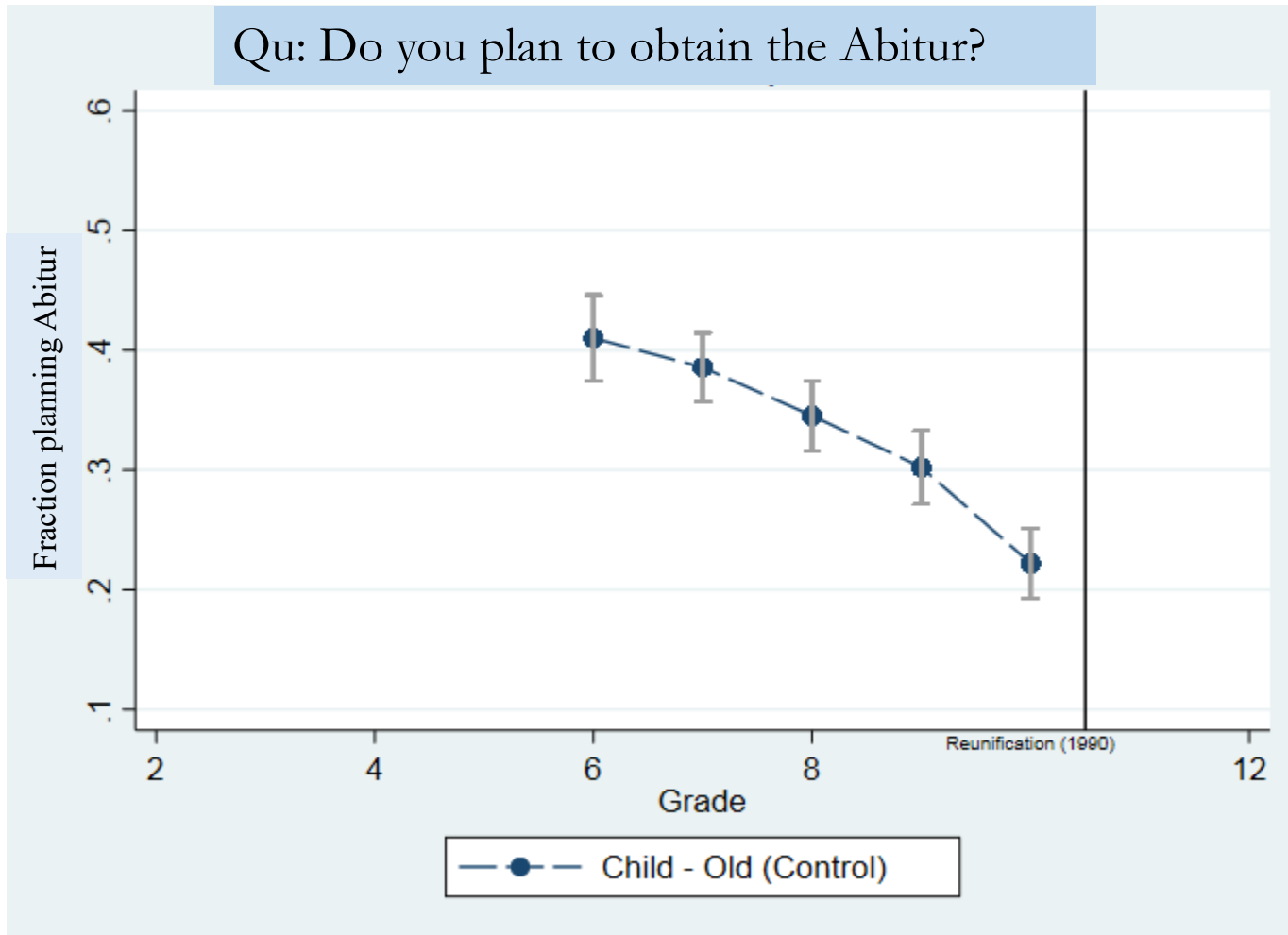
Educational Plans: Younger Cohort

Qu: Do you plan to obtain the Abitur?
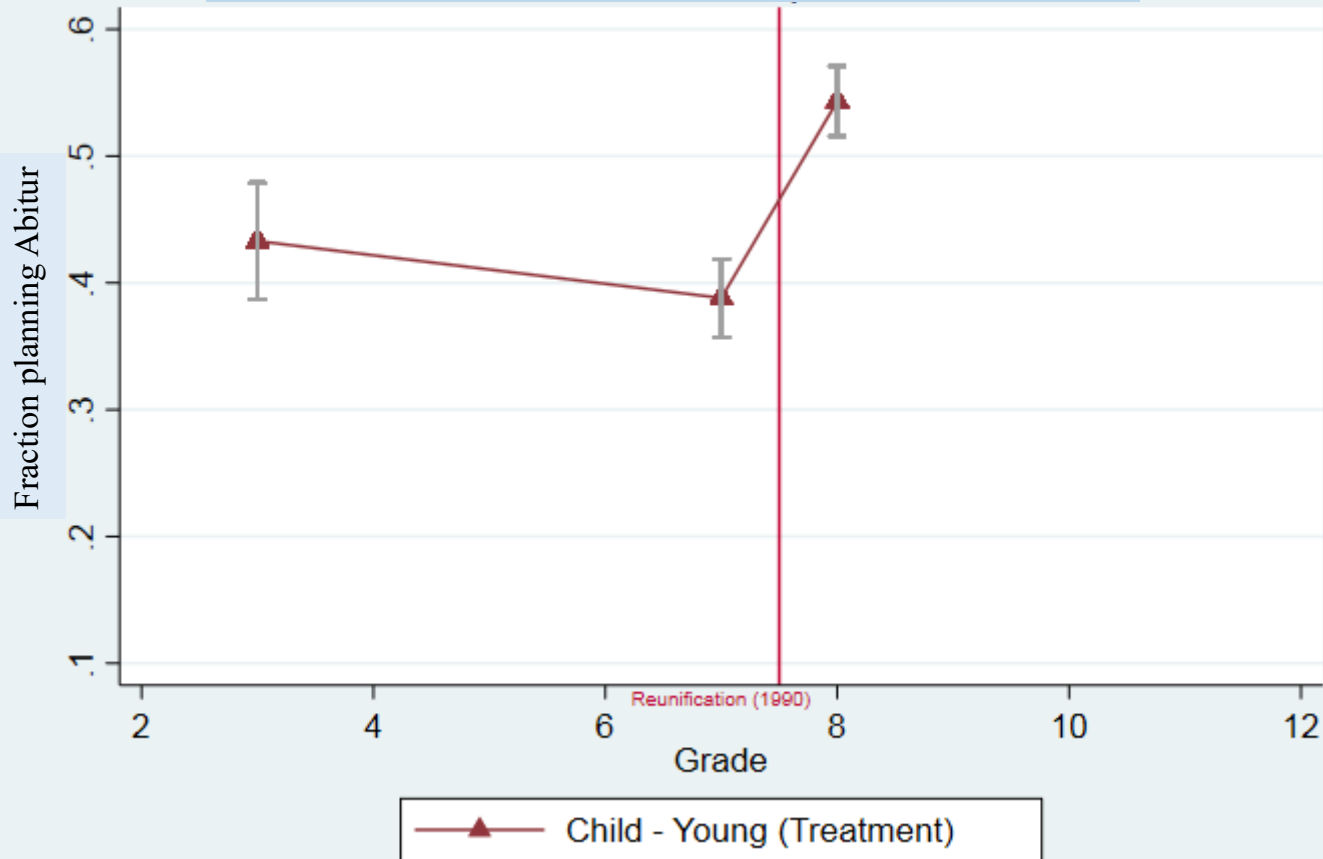
Effect of Reunification on Educational Plans

Qu: Do you plan to obtain the Abitur?
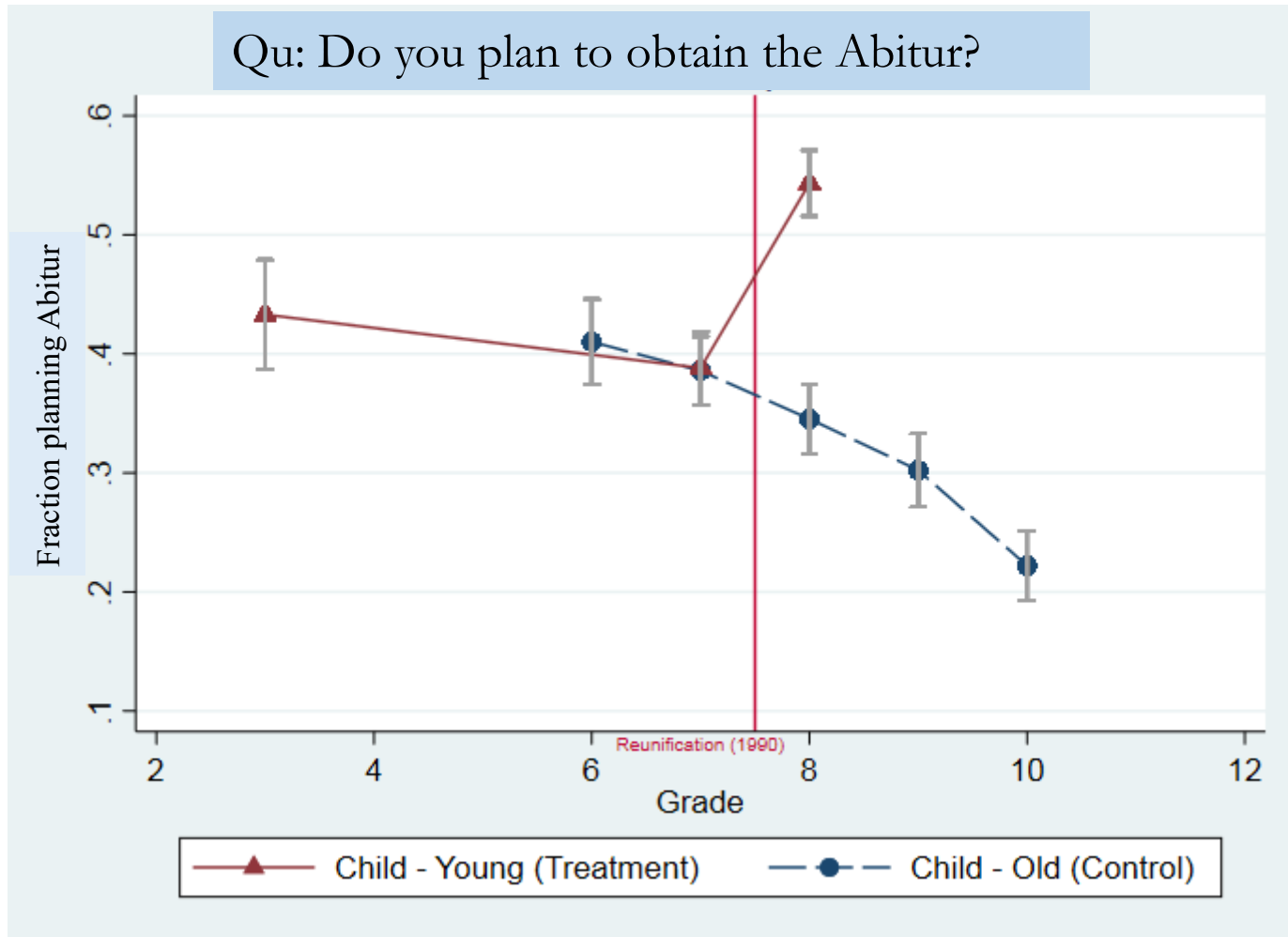
Short-Run Impact: Regression Analysis

Educational Plans (SR)

	Abitur Plans					
	Main			Placebo Test (Pre-Trend)		
	[1]	[2]	[3]	[4]	[5]	[6]
Treated Cohort x Post Reunification	0.181***	0.219***	0.219***	-0.014	-0.005	-0.005
	[0.031]	[0.023]	[0.028]	[0.039]	[0.033]	[0.035]
Treated Cohort (Young)	0.018			0.032		
	[0.023]			[0.031]		
Post Reunification (Grade 8)	-0.045**	-0.047***	-0.047***	-0.022	0.056***	0.056***
	[0.022]	[0.013]	[0.014]	[0.024]	[0.019]	[0.017]
Constant	0.395***	0.394***	0.394***	0.417***	0.379***	0.379***
	[0.015]	[0.006]	[0.008]	[0.019]	[0.010]	[0.010]
N Individuals	2609	2609	2609	1950	1950	1950
N Observations	3989	3989	3989	2936	2936	2936
Individual FE	NO	YES	YES	NO	YES	YES
Clustering level	None	Indiv.	School	None	Indiv.	School
R-squared	0.025	0.069	0.069	0.001	0.013	0.013

Long-Run Impact: Regression Analysis

Long-run Outcomes

Does increase in educational plans, in response to the regime change, translate into higher Abitur completion rates?

- We measure whether educational plans (in **grades 7 and 8**) are linked to the likelihood of Abitur completion (**grade 12**), i.e. several years later.

Abitur Completion (LR) – Research questions

1) **Do plans predict attainment (and grade 8 better than 7)?**

2) **Is this effect stronger for the young cohort?**

3) **Do changes in plans by grade 8 explain change in attainment?**

Abitur Completion (LR) – Findings

1) Do plans predict attainment (and grade 8 better than 7)?

Abitur plans in **Grade 7** → 47 pp higher chance achieving it

Abitur plans in **Grade 8** → 61 pp higher chance achieving it

2) Is this effect stronger for the young cohort?

More students from younger cohort obtain Abitur and plans more predictive *BUT* plans are important across *BOTH* cohorts

3) Do changes in plans by grade 8 explain change in attainment?

Link between plans and attainment became stronger after Reunification → **Explains all of cross-cohort difference**

Abitur Completion (LR)

	Abitur Completion			
	[1]	[2]	[3]	[4]
Treated Cohort (Young)	0.331***	0.170***	0.250***	0.019
	[0.034]	[0.027]	[0.040]	[0.026]
Abitur Plan in Grade 7	0.476***		0.394***	
	[0.024]		[0.034]	
Abitur Plan Gr 7 x Treated Cohort			0.169***	
			[0.043]	
Abitur Plan in Grade 8		0.614***		0.445***
		[0.030]		[0.042]
Abitur Plan Gr 8 x Treated Cohort				0.297***
				[0.051]
Constant	0.041*	0.017	0.081***	0.086***
	[0.021]	[0.020]	[0.020]	[0.015]
N Individuals	1027	1220	1027	1220
N Observations	1027	1220	1027	1220
R-squared	0.338	0.454	0.345	0.475

Shedding light on mechanisms

Mechanisms

Why do educational plans change?

Standard educational model suggests three important determinants:

1. Expected returns to education

2. Uncertainty

3. Economic and social preferences.

4. Constraints (supply-side)

Data on different potential determinants rarely available

What we do:

FIRST: Estimate the impact of regime change on beliefs and preference

SECOND: Link changes in plans to changes in these factors

- Apply same identification strategy as before

- Timing: allows to measure (immediate) change in perceived returns

Mechanism – Findings

Perceived Returns: On scale of 1 to 4, the importance of education for later earnings: 0.49 s.d. ↑

Perceived Uncertainty: On scale of 1 to 4, anxiety towards the unknown: 0.39 s.d. ↑

Economic Preferences: On scale of 1 to 4 (combined index): 0.31 s.d. ↑

Social Preferences: On scale of 1 to 4 (combined index): : 0.36 s.d. ↓

Constraints: No evidence for importance of (relaxation of) access constraints or of change in educational content/quality for short-run change in Abitur plans.

Link between Changes in Abitur Plans and Determinants

	Change in Abitur Plans						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Link to Change in							
Perceived Returns	0.051**				0.049**	0.045**	0.044**
	[0.021]				[0.021]	[0.020]	[0.020]
Perceived Uncertainty		0.053**			0.051*	0.051*	0.055**
		[0.026]			[0.026]	[0.026]	[0.025]
Economic Prefs.						0.016	0.025
						[0.024]	[0.025]
Social Prefs.			-0.074***	-0.074***			-0.078***
			[0.023]	[0.023]			[0.023]
N Individuals	2609	2609	2609	2609	2609	2609	2609
N Observations	3589	3589	3589	3589	3589	3589	3589
R-squared	0.005	0.004	0.011	0.011	0.008	0.009	0.021
Test for joint signif. (p-val.)	0.016	0.046	0.002	0.002	0.019	0.045	0.001

Adjustment Process

Adjustment Process: Identification

- To identify the **causal effect of Reunification** on the younger cohort, use DID with the older cohort's evolution between the same **grades** (**before** Reunification) as counterfactual
  - using the same years, the older cohort is likely to be affected as well.

- To understand **differences in *adjustment*** between younger and older cohorts, estimate DID using as counterfactual the older cohorts' evolution between the same **years**.
  - Finding an effect of zero would imply that the older cohort can adjust to the same extent as the younger cohort.

- **Design:** DID that focuses on the **years** directly **pre- and post-** Reunification for the younger cohort and the older cohort.

Adjustment Process: Findings

- *Perceived Returns:* Older and younger cohort adjust quickly and to the same extent (no difference in adjustment).

- *Perceived Uncertainty:* Older cohort adjusts somewhat less in terms of uncertainty.

- *Economic Preferences:* Older cohort adjusts somewhat less in terms of economic preferences.

- *Social Preferences:* Older cohort adjusts much less than younger cohort in terms of social and political preferences.

- **Overall, linked to the fact that the older cohort adjust less their educational plans.**

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Discussion and Conclusion

Conclusion

- **Main results:**
  - Educational plans of adolescents adapt rapidly to societal change
  - Translate into sizeable increase in long-run educational attainment.

➔ *Sheds light on process of forming educational plans and on relevance for long-run outcomes.*

- **Mechanisms and process of adjustment:**
  - Actual returns to education increases and adolescents quickly update their beliefs on returns
    - Largest increase in college plans among those who update the most
  - Perceived risk and social preferences also adapt
    - Largest increase in college plans among those whose preferences converge most to those of West
  - Educational stage matters:
    - Return perceptions adjust rapidly for older **and** younger cohort
    - Preferences adjust quickly for younger cohort, but to a lesser extent for the older cohort → adjust less educational plans

➔ *Sheds light on mechanisms and speed of adjustment to shocks*